
Other: Application of the Standards to Alterations

Description

This measure will expand the scope of the *Standards* to cover a wider range of situations when alterations are made to the dwelling. Examples of opportunities for expanded requirements include replacement windows, HVAC, duct sealing and insulation, and other envelope changes. Different Standards mechanisms and triggering events will apply, depending on the measure.

The current *Standards* establish requirements when a building is altered. Alterations are defined as changes to a building's water-heating system, space-conditioning system, lighting system, or envelope that does not increase the conditioned floor area or volume. Mandatory requirements for certain features regulated under Subchapter 2, like insulation (§118(d)), must be met. Additional requirements identified in Subchapter 9 (§152(b)) include prescriptive requirements for fenestration, space conditioning, and water heating systems. The 2001 *Standards* added testing of refrigerant charge or a Thermostatic Expansion Valve (TXV) to the space conditioning requirements (the Residential Manual allows the use of a 12 SEER instead) on replacement air conditioning equipment. There is also an exception in the *Standards* (Note to §152(b)) that exempts replacement fenestration not completed as part of an alteration from meeting the fenestration requirements. Each of these code sections will be studied and modified as needed.

Requirements for energy efficient replacement windows represent a major opportunity for energy and demand savings. Approximately half of the windows sold in California are replacement products, indicating a significant opportunity even though many replacements are already made with high performance windows. There are several types of requirements to consider for replacement windows. The simplest would be to establish specific performance levels as a mandatory measure, which could be added to section 116 or section 152(b) and could vary by climate zone if needed. An alternative approach would be to require that replacement windows meet the prescriptive requirements found in the packages (§151(f)) or newly-added prescriptive requirements for alterations. A performance option could continue to be available for cases where alternative products are desirable. The requirement for improved glazing would be when the fenestration product (combined window frame and glass unit) is being replaced. Products being repaired would continue to be exempt. Language from the *International Energy Conservation Code*, which has replacement window requirements, may provide useful guidance for this change.

Another significant opportunity exists to improve the ductwork, either with sealing and/or insulation done in conjunction with equipment replacement. Other options include: 1) increased attic insulation or radiant barriers when roofing is replaced; 2) installation of TXVs when furnaces are replaced; 3) replacement of matching indoor units when outdoor split system air conditioner units are being replaced; 4) wall insulation when homes are re-stuccoed, or re-sided. Each of these measures will be studied for inclusion in the *Standards*.

AB 549 and AB 1574 recently were passed by the state Legislature and signed by the governor. Both of these statutes potentially affect alterations in existing buildings. AB 549 requires the CEC to conduct a study of how best to address energy savings opportunities in existing residential and nonresidential buildings and report to the state Legislature by January 1, 2004. Possible recommendations could include new legislation to expand regulatory authority over existing buildings or initiate a non-regulatory program of some kind. AB 1574, among other things, gives the CEC explicit authority to develop consumer information regarding energy efficiency opportunities in existing residences.

Benefits

California has millions of existing dwelling units, the majority of which were constructed before there were energy requirements. Every time homeowners upgrade or replace building components without bringing the components up to current standards is a lost opportunity, as the most cost effective time to upgrade existing products to energy efficient products is at the time of replacement. Situations can also exist where the original construction had an energy efficient product and the homeowner installs a less efficient product. While only a fraction of existing dwellings are altered every year and many have already had some energy upgrades, the potential energy and demand savings overtime would be very large.

Environmental Impact

Significant energy, and therefore pollution savings, will occur with increased standards for alterations.

Type of Change

The proposed changes would be accomplished with a combination of modifications to Subchapter 2, the mandatory measures, and the prescriptive requirements. Changes would be documented in the *Standards* themselves, the Residential Manual, and alteration compliance forms. ACM Rules for Existing plus Alterations should also be reviewed for consistency with any changes.

A major effort will be required to make sure that everyone affected by a new alteration requirements is informed, including homeowners, builders, remodelers, contractors, building officials, vendors, retailers, and others.

Measure Availability and Cost

The alterations affected by this proposal will likely mimic the features required for new construction, so the required products will either be widely available when implemented, or can be reasonably provided by product manufacturers when the demand for the product is clear. The measure costs will likely be higher than new construction in most cases where installation is more difficult or economies of scale apply. There are also likely to be problems with upgrades to some components, such as the need to match the appearance of existing windows. Adaptation problems may also arise for some small businesses who specialize in the replacement market.

One significant issue affecting the impact of requirements for alterations is the common practice for many alterations to be done without building permits. The scope section of the *Standards* currently says that they apply to construction “for which an application for a building permit or renewal of an existing permit is filed or required by law to be filed.” The *California Building Code*, Volume 1, Section 106 specifies when a building permit is required.

Useful Life, Persistence and Maintenance

The life of the component installed as a result of new requirements would likely not be different than the life of the product that the homeowner would have installed without the influence of the Standard.

Performance Verification

Some potential measures, like duct sealing or refrigerant charge and airflow, would require verification if treated the same as their new construction counterparts.

Cost Effectiveness

Establishing the baseline for life cycle costing will require a significant effort, as there is more diversity in existing construction characteristics than in new construction. For example, the benefits of adding ceiling insulation depend on the amount of existing insulation. As a result, it will be necessary to study the benefits of upgrading from several different levels, like R0, R11, and R19. For many upgrades, like replacement windows where the homeowner is already opting for an energy efficient product, only the added cost of the more efficient product may need to be considered. Some features that are inexpensive in new construction, such as duct sealing, may not be as cost effective in alterations where labor costs may be higher and the performance improvements may be less because of the difficulty of sealing existing ducts.

Analysis Tools

The analysis of measuring energy savings for new homes will be adapted for use in this effort.

Relationship to Other Measures

N/A

Bibliography and Other Research

Cardinal Glass Industries provided written documentation about replacement windows for the October 22, 2001 workshop and during the AB 970 proceedings.